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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/761,820

01/21/2004

Sudhir S. Malhotra

K2003010

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12/12/2005

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EXAMINER

RICKMAN, HOLLY C

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/761,820 | <b>Applicant(s)</b><br>MALHOTRA ET AL. |  |
|                              | <b>Examiner</b><br>Holly Rickman     | <b>Art Unit</b><br>1773                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/25/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3, 13, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3, 13, and 20 are rendered indefinite by the phrase “underlayers substantially lack boron.” It is not clear from the specification or the prior art how a material can “substantially” lack boron. The metes and bounds of this limitation are not clear. The term “lack”, per se, implies the absence of boron. However, the term “substantially” implies that boron is not necessarily absent or lacking.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 12, 14, 16-19, and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Kanbe et al. (US 6830837).

Kanbe et al. disclose a magnetic recording medium having a substrate formed from a NiP-plated Al alloy, a first underlayer formed from a Cr alloy, a second underlayer formed from a Cr alloy containing B used to reduce grain size of an overlying magnetic layer and thereby reduce media noise, a non-magnetic Cr-containing alloy (CoCr alloy), a and a magnetic layer thereon. The reference also teaches that a non-magnetic coupling layer and an additional magnetic layer can be deposited to form an anti-ferromagnetically coupled recording layer structure. See col. 6, line 39 to col. 7, line 9 and claim 1.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (US 6645551) in view of Kanbe et al. (US 6830837).

Wong discloses a magnetic recording medium having a NiP-plated substrate, Cr-based, bcc underlayers and a magnetic recording layer. The disclosure of using more than two underlayers (col. 3, lines 31-32) would have suggested to one of ordinary skill in the art at the time of invention that 3, 4, or more underlayers would be within the scope of the invention. As such, the examiner takes the position that any underlayers in addition to the three described

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above would meet the limitation set forth in claims 8, 15, and 21 directed to a nucleation layer between the magnetic layer and the third underlayer. The reference suggests the use of three (i.e., two *or more* – col. 3, line 31-32) Cr-based bcc underlayers wherein each layer is formed from one of Cr, CrX or CrXY and X and Y are chosen from a group of alloying elements. The reference discloses examples of suitable alloying elements but fails to disclose the use of B in at least the second underlayer. The reference is also silent with regard to the use of antiferromagnetically coupled magnetic layers.

Kanbe et al. teaches that it is known in the art to add B in small amounts to bcc Cr alloy underlayers in order to reduce medium noise. It would have been obvious to one of ordinary skill in the art at the time of invention to add B to the Cr alloy underlayers taught by Wong in order to reduce medium noise. The examiner maintains that the amounts of boron suggested by Kanbe et al. (15 at% or below) are small enough to meet the recitations of claims 3, 13 and 22 in the absence of evidence to the contrary.

With respect to claim 4, Kanbe et al. teach that B is desirably added in an amount of 15 at% or less. Because the addition of B affects the grain size of the overlying magnetic layer, it would have been obvious to one of ordinary skill in the art at the time of invention to add an optimal amount of B to achieve optimal magnetic recording grain size. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claims 10, 17, and 23, Kanbe et al. teaches that substituting antiferromagnetically coupled magnetic layers for a single magnetic layer increases thermal stability of the medium (col. 3, lines 29-52). It would have been obvious to one of ordinary skill

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in the art at the time of invention to substitute antiferromagnetically coupled magnetic layers for the single magnetic layer taught by Wong in order to improve the thermal stability of the medium.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Holly Rickman  
Primary Examiner  
Art Unit 1773